National Institute of Environmental Health Sciences

Climate change and animal diseases: Making the case for adaptation

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Year: 2012
Journal: Animal Health Research Reviews / Conference of Research Workers in Animal Diseases. 13 (2): 209-222

Abstract:

The exponential expansion of the human population has led to overexploitation of resources and overproduction of items that have caused a series of potentially devastating effects, including ocean acidification, ozone depletion, biodiversity loss, the spread of invasive flora and fauna and climatic changes - along with the emergence of new diseases in animals and humans. Climate change occurs as a result of imbalances between incoming and outgoing radiation in the atmosphere. This process generates heat. As concentrations of atmospheric gases reach record levels, global temperatures are expected to increase significantly. The hydrologic cycle will be altered, since warmer air can retain more moisture than cooler air. This means that some geographic areas will have more rainfall, whereas others have more drought and severe weather. The potential consequences of significant and permanent climatic changes are altered patterns of diseases in animal and human populations, including the emergence of new disease syndromes and changes in the prevalence of existing diseases. A wider geographic distribution of known vectors and the recruitment of new strains to the vector pool could result in infections spreading to more and potentially new species of hosts. If these predictions turn out to be accurate, there will be a need for policymakers to consider alternatives, such as adaptation. This review explores the linkages between climate change and animal diseases, and examines interrelated issues that arise from altered biological dynamics. Its aim is to consider various risks and vulnerabilities and to make the case for policies favoring adaptation.

Source: http://dx.doi.org/10.1017/s1466252312000199

Resource Description

Early Warning System: ☑

resource focus on systems used to warn populations of high temperatures, extreme weather, or other elements of climate change to prevent harm to health

A focus of content

Exposure : ☑

weather or climate related pathway by which climate change affects health

Ecosystem Changes, Extreme Weather Event, Food/Water Quality, Food/Water Quality, Food/Water Security, Meteorological Factors, Precipitation, Solar Radiation, Temperature, Unspecified Exposure

Extreme Weather Event: Drought, Flooding, Hurricanes/Cyclones

Food/Water Quality: Pathogen, Pathogen, Pathogen

Food/Water Security: Livestock Productivity

Temperature: Extreme Heat, Fluctuations

Geographic Feature:

resource focuses on specific type of geography

None or Unspecified

Geographic Location:

resource focuses on specific location

Global or Unspecified

Health Co-Benefit/Co–Harm (Adaption/Mitigation):

specification of beneficial or harmful impacts to health resulting from efforts to reduce or cope with greenhouse gases

A focus of content

Health Impact:

specification of health effect or disease related to climate change exposure

General Health Impact, Infectious Disease

Infectious Disease: Foodborne/Waterborne Disease, General Infectious Disease, Vectorborne Disease, Zoonotic Disease

Foodborne/Waterborne Disease: Campylobacteriosis, Cholera, Leptospirosis, Salmonellosis

Foodborne/Waterborne Disease (other): botulism; dysentery; helminth

Vectorborne Disease: Fly-borne Disease, General Vectorborne, Mosquito-borne Disease, Tick-borne Disease

Fly-borne Disease: Trypanosomiasis

Mosquito-borne Disease: Rift Valley Fever

Tick-borne Disease: Crimean-Congo Haemorrhagic Fever, Rickettsiosis (Non-Rocky Mountain Spotted Fever)

Zoonotic Disease: General Zoonotic Disease, Other Zoonotic Disease

Zoonotic Disease (other): avian influenza; SARS

Intervention:

strategy to prepare for or reduce the impact of climate change on health

A focus of content

Medical Community Engagement:

resource focus on how the medical community discusses or acts to address health impacts of climate

change

A focus of content

Mitigation/Adaptation: ☑

mitigation or adaptation strategy is a focus of resource

Adaptation, Mitigation

Resource Type: ☑

format or standard characteristic of resource

Policy/Opinion, Review

Timescale: ☑

time period studied

Time Scale Unspecified

Vulnerability/Impact Assessment: ☑

resource focus on process of identifying, quantifying, and prioritizing vulnerabilities in a system

A focus of content